

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference C1102/7002W0	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 01/10236	International filing date (day/month/year) 30/03/2001	(Earliest) Priority Date (day/month/year) 31/03/2000
Applicant UNIVERSITY TECHNOLOGY CORPORATION		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☒ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☒ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

EXPRESSION OF UNCOUPLING PROTEIN (UCP) IN PLANTS

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority. ✓

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

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Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The invention relates to methods and products for manipulating plant metabolism and resistance to infection by expression of a cell wall uncoupling protein (UCP).

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/82 C12N15/63 A01H1/00 A01H5/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, MEDLINE, SCISEARCH, CHEM ABS Data, BIOTECHNOLOGY
ABS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 90 08831 A (ICI PLC) 9 August 1990 (1990-08-09) claims 1,2,9-11; examples 4,5 --- -/--	1,3, 7-11,15 2-6, 11-14, 17,18, 23-37, 42-48

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

24 October 2001

Date of mailing of the international search report

09/11/2001

Name and mailing address of the ISA

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ALCONADA RODRIG..., A

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>RICQUIER DANIEL ET AL: "The uncoupling protein homologues: UCP1, UCP2, UCP3, StUCP and AtUCP." BIOCHEMICAL JOURNAL, vol. 345, no. 2, 15 January 2000 (2000-01-15), pages 161-179, XP002180562 ISSN: 0264-6021 page 173, right-hand column, last paragraph -page 174, left-hand column, paragraph 1 page 167, right-hand column, paragraph 2 - paragraph 3</p>	2,3,5, 11,12, 25-27, 42-48
Y	<p>LALOI M ET AL: "A plant cold-induced uncoupling protein." NATURE, vol. 389, no. 6647, 11 September 1997 (1997-09-11), page 135-136 XP002180563 the whole document</p>	5,12
Y	<p>MAIA IVAN G ET AL: "AtPUMP: An Arabidopsis gene encoding a plant uncoupling mitochondrial protein." FEBS LETTERS, vol. 429, no. 3, 16 June 1998 (1998-06-16), pages 403-406, XP002180564 ISSN: 0014-5793 the whole document</p>	4,6,12
Y	<p>SAVIANI ELZIRA E ET AL: "Fatty acid-mediated uncoupling of potato tuber mitochondria." BIOCHEMISTRY AND MOLECULAR BIOLOGY INTERNATIONAL, vol. 44, no. 4, April 1998 (1998-04), pages 833-839, XP001034371 ISSN: 1039-9712 the whole document</p>	13,14
Y	<p>FR 2 767 058 A (CENTRE NAT RECH SCIENT) 12 February 1999 (1999-02-12) page 6, line 21-28 page 3, line 11 -page 5, line 15</p>	13
Y	<p>WO 88 02402 A (CALGENE INC) 7 April 1988 (1988-04-07) see examples and claims</p>	17,18, 28-37
Y	<p>US 5 360 726 A (RAIKHEL NATASHA V) 1 November 1994 (1994-11-01) examples 1,2</p>	23,24

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	<p>WINKLER EDITH ET AL: "UCP3 expressed in yeast is primarily localized in extramitochondrial particles." BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 282, no. 1, 23 March 2001 (2001-03-23), pages 334-340, XP002180565 ISSN: 0006-291X</p>	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1, 7-10, 13-44 and 47-49 (partially)

Present claims 1-49 relate to an extremely large number of possible of polypeptides, namely, every possible extra-mitochondrial (cell wall, plasma membrane, chloroplast, pore and plasmodesmata) uncoupling protein (UCP). Support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the UCPs claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the mammalian UCP1, UCP2, UCP3, UCP4, UCP5 and UCP6 and to the plant StUCP, AtUCP and AtPUMP (see page 6, line 10 to page 7, line 2 and page 12 of the description).

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1, 7-10, 13-44 and 47-49 (partially)
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9008831	A	09-08-1990	AU 621201 B2	05-03-1992
			AU 5022690 A	24-08-1990
			CA 2008697 A1	26-07-1990
			EP 0455690 A1	13-11-1991
			WO 9008831 A1	09-08-1990
			ZA 9000606 A	31-10-1990
FR 2767058	A	12-02-1999	FR 2767058 A1	12-02-1999
			AU 8543098 A	01-03-1999
			EP 1018338 A1	12-07-2000
			WO 9907358 A1	18-02-1999
			ES 2147519 A1	01-09-2000
WO 8802402	A	07-04-1988	AU 620317 B2	20-02-1992
			AU 8079787 A	21-04-1988
			EP 0285646 A1	12-10-1988
			JP 1501038 T	13-04-1989
			WO 8802402 A1	07-04-1988
US 5360726	A	01-11-1994	US 5525713 A	11-06-1996
			US 6127532 A	03-10-2000
			US 5276269 A	04-01-1994